



DESCRIPTION OF THE HEMITROPE, OR INTERLOCKING DOUBLE WEDGE BLOCK.

FIG. 1 is an isometrical, and fig. 2 a linear bird's-eye view. On referring to fig. 2 it will be seen that the block is most economically cut from round timber, shown by the circular boundary line. The upper surface consists of six sides, three of which, *a a a*, being larger, and three, *b b b*, being smaller than the sides of a hexagon inscribed in the same circle. The under surface has the same boundary lines for its sides, viz. three *a' a' a'* being equal to *a a a*, and three *b' b' b'* being equal to *b b b*; but these are turned round in such a position that each of the larger shall be parallel to the smaller, and vice versa, thus forming two triple wedges, the one to resist upward, and the other downward pressure. The block, then, consists of three pairs of parallel sides, as does the hexagon, but they are not, like them, at right angles to the surface, but at an angle; those at *a a a* ten degrees more, and those at *b b b* being ten degrees less, though it is not confined to this angle, it being determined by the depth of the block and the quantity of wedge required. But let the angle be what it may, if the top and bottom of the block were equal, and it was bisected parallel to the surface, it would present a perfect hexagon. The mode of grooving is shown in fig. 1, though any other might be adopted if it should be found necessary.

These blocks are produced by a machine at four operations, which first crosscuts them into lengths of six inches; these are placed on a travelling bed, fixed at the required angle to receive the first two cuts from parallel circular saws; these are retroceded and placed in a proper position for cutting the second pair of sides, and again the process is repeated, which finishes the block ready for grooving; they may then be laid, which is effected as follows. First, a square line is started from, by means of half blocks; the whole ones are then worked in, as shown in fig. 1, in a triangular form, like piling shot; it is then filled up at the sides, wedging the blocks more or less, according to their state of dryness, so that when they get wet, they shall not rise or burst the curb, as was the case at St. Giles's; pavement, like many other things, may be too well done. From the nature of these blocks reposing on each other, it will be seen that on a weight coming on any block, it is distributed to each of its three

neighbours, who again distribute it to each of their three, thus following the well-known law, that the pressure is absorbed in the square of the distance from the block. It may be more familiarly illustrated by the dropping of a stone in water, and observing the lessening circles: just so in this block, the weight lessens on each individual until it is all absorbed. By the above interlocking arrangement, it will be seen, the integrity of the pavement can neither be disturbed nor broken while the abutments remain firm. It may fairly be presumed that a much less expensive foundation will be sufficient. A saving of at least one-half is effected in concrete; this, at 6 inches deep, costs eighteen-pence per yard; the saving under this head per superficial yard will therefore be more than 9d.

Now, in first class streets the stones are 9 inches deep; with a 6-inch concrete (and none of the wood paving companies use less), and 6-inch blocks, there would require 3 inches of excavation and carting away soil; this is worth 1 penny per yard per inch. With the hemitrope block, the whole of this is saved; if laid on a shingle or gravel bottom, the saving would be more than 9d.

Let us now see how it stands with regard to economy in conversion from round timber (Scots fir is used): theoretically there is 114 yards of paving 6 inches deep in a load of timber (50 cubic feet). In taking a tree, say 84 diameter, the cross section of which contains 51,836 superficial inches, a hexagon inscribed thereon, 42,525; a hemitrope block, 41,5205, and a square used by the Count de Lisle 33,0625, there being a loss of 18 per cent. in Stead's, 20 in the hemitrope, and 32½ in the Count de Lisle's, and thus the hexagon produces 9½, the hemitrope 9, and the Count de Lisle's 7½ superficial yards per load of timber, though in practice it will be found a considerable allowance must be made for waste, not connected with the form of the block, but common to all: thus, at 45s., about the price of Scots fir delivered in London, the price per yard will be, hexagon, 4s. 10d. nearly, hemitrope, 5s., and Count de Lisle's, 5s. 10½d.; the hemitrope thus costing 2d. per yard more than the hexagon, and 10½d. per yard less than the Count de Lisle's.

In manufacturing, the difference is more striking in the Count de Lisle's, but it is equal in Stead's and the hemitrope. This, as before stated, is done at four operations, each of which is worth about threepence per yard: the cost of producing them is therefore one shilling. The Count de Lisle's has, in addition to this, the operations of boring, preparing oak-pins, providing the same, pinning and forming into masses. This cannot cost less than two shillings per yard; the hemitrope and Stead's have, therefore, the advantage over the Count de Lisle's of one shilling per yard in manufacture.

In laying, Stead's and the hemitrope are equal, as they require merely placing and moderately driving up; the Count de Lisle's, from being in masses, are not so easily handled, and cannot be laid so rapidly. The difference may be illustrated by the fact that a brick-

layer would get over more work with single bricks than more unwieldy lumps; the saving in laying may, therefore, be one penny per yard. These are all the savings to be effected at first outlay: the following is a recapitulation:—

	Saving of Hemitrope over Stead's.	Over Count de Lisle's.
In foundation . . .	0 9	0 9
In excavation . . .	0 3	0 3
In timber . . .	0 0	0 10½
In manufacture . . .	0 0	1 0
In laying . . .	0 0	0 1
Less loss in timber . . .	1 0	2 11
Gross saving effected . . .	0 10	2 11½

Thus it is seen there is a saving of 10d. per yard over the cheapest yet produced (the hexagon), and of 2s. 11½d. over the most popular (Count de Lisle's) while the hemitrope block unites the desiderata of the whole. But it is also superior to them in some things; for instance, though the hexagon and the hemitrope are equal in expense in laying, raising, and relaying, yet it will be found superior to it, inasmuch as it will not be liable to sink in the newly-formed concrete, where the pavement is taken up for repair, which is of very frequent occurrence, as all the thoroughfares of the metropolis are traversed under-ground by a net-work, as it were, of gas and water-pipes. In the event of one of the latter bursting, unless some egress for the water is provided for, the effect will be to blow up or flut the pavement; now in the hemitrope the effect will be, the water will force the mud out of the funnel-shaped interstices formed by construction of the block, and thus get vent.

It has not been contrasted with any other pavements, Perring's for instance, because it being so nearly like the Metropolitan is in some points to be identified with it, while the saving will be trifling, from the fact of the expense of manufacturing the interstitial slip will almost counterbalance the saving in wood: all the others yet laid down being either failures, or so expensive as to be impracticable.

To sum up the advantages, then, it has simplicity in construction, in laying, raising, and relaying, and in manufacture, can be therefore rapidly laid down by any labourer, and when down and properly fitted, by the expansion of the timber on being wetted, this pavement will then form one solid mass, which has as yet nowhere been got, except by Rankins' pavement at St. Giles's Church, a pavement excellent in its kind, but from its great expense in construction, it is for all street-paving impracticable, while the same effect is produced in the hemitrope block by its simple, cheap, and geometrical figure.

It is now confidently submitted to the world, to stand or fall by its own merits, though unfortunately merit alone is not always successful. It requires assistance and publicity; it is, however, in good hands for the latter, THE BUILDER's motto being, "A clear stage and no favour;" and, in sporting language, "May the best horse win."

**NEW CHURCH AT CAMBERWELL.**—The foundation of a new church has been laid for this parish; the site is very convenient for the inhabitants of Denmark Hill, Herne Hill, and Dulwich, being situate between the former; the plan is described as being chaste and elegant. Mr. Garrett, of the firm of Copeland and Garrett, a resident in the immediate neighbourhood, has promised to present a pulpit of porcelain to the church; this will indeed be a novelty, but we know of no objection on that account.

Lord Panmure has given the magnificent sum of 1,000l. in aid of the intended erection of the infirmary at Arbroath.

The foundation-stone of a new temperance hall and church was laid on Easter Monday.

**GOthic CHURCH AT HAM.**—There has been recently erected at Ham, in Derbyshire, to the memory of Mrs. Watts Russell, of Ham Hall, a singularly elegant Gothic structure, resembling in its general character the Eleanor Crosses, without being a direct imitation of any one of them. Neither is the beauty of the execution at all inferior to the design; indeed, it has been acknowledged by competent judges to be the most perfect specimen of Gothic art which has been produced in modern times, and is therefore likely to increase the already high reputation of its architect, Mr. Darick, of Oxford.